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THE NAIADES OF MISSOURI.—VI.

BY WILLIAM I. UTTERBACK.

Nephronaias ligamentina (Lamarck).

Pl. XXV, Figs. 85 A and B.

1819—*Unio ligamentina* Lamarck, An. San. Vert., VI, p. 72.

1900—*Lampsilis ligamentina* Simpson, Proc. U. S. Nat. Mus., XXII, p. 539.

1912b—*Nephronaias ligamentina* (Lam.) Ortmann, An. Car. Mus., VIII, p. 325.

ANIMAL CHARACTERS.

NUTRITIVE CHARACTERS:—Branchial opening large with strong papillae; anal distinctly crenulated; supra-anal rather small, well separated from anal by thick mantle connection; gills very large, inner laminae of inner gills entirely connected to visceral mass; palpi very large, wide and pointed; color of soft parts dingy white for most part, however, post-mantle edge brownish.

REPRODUCTIVE STRUCTURES:—Marsupia occupying most of outer gills, consisting of about sixty ovisacs well separated by thick septa, when gravid extending far below original edge of sterile marsupium, making a longitudinal line; mantle edge antero-ventrad to branchial opening with twenty-five or thirty low denticulations; conglutinates white, broad, leaf-like, solid when ova are present, cohesion lost when mature glochidia are developed; glochidia semi-elliptical, spineless, large, hinge line undulate, measures 0.220 x 0.260mm.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell rather evenly eliptical, solid, moderately inflated, beaks rather low, sculpture consisting of several fine, wavy, concentric lines most pronounced at foot of posterior and anterior slopes; disk smooth; epidermis brown or yellowish with broad, dark-green rays.

INTERNAL STRUCTURES:—Cardinals rather stumpy and stout; interdentum rather short and cut away; laterals very strong; nacre white with stippled effect—a very valuable shell commercially for this reason.

Sex	Length		Height		Diameter	Locality
♀	110	x	68	x	44.5mm	(Marais des Cygnes, Rich Hill)
♂	110	x	65	x	43.5mm	(Meramec R., Meramec Highlands)
♀	90	x	59	x	32.0mm	(Osage R., Osceola)
♂	35	x	21	x	10.0mm	(Gasconade R., Gascondy)
	15.5	x	8	x	4.0mm	(St. Francis R., Greenville)
	8.5	x	5	x	3.0mm	(St. Francis R., Greenvile).

These last two measurements are those of *two byssiferous juveniles* identified by Dr. Howard and Prof. Clark. At first the writer was inclined to call them *L. luteola* chiefly on the grounds that both were found clinging by their byssi to a *costata* shell in a bed where *luteola* predominated; however, this identification was excluded on the basis of the presence of anterior rays and a difference of umbonal sculpture being less prominent with the ridges more broken in case of juvenile *ligamentina* as shown in these two specimens. The byssus is attached to the upper posterior part of the foot although it extends out antero-ventrad between the valves. In the smaller juveniles the bysuss is about 120mm long, in the larger 135mm. Both bear dense papillae on both branchial and anal openings. Anterior end of outer gills lifted up very high above the palpi, gills dark tan-color; branchial papillae rusty red; epidermis yellowish with bright broad green rays—mostly placed anteriorly.

MISCELLANEOUS REMARKS:—While *N. ligamentina* may have the widest general distribution of the North American *Naiades*, yet it *is not found anywhere in the interior of this State north of the Missouri River*. However, it is the most common of species in the Mississippi, the Des Moines and in all the interior drainage south of the Missouri. It is not inclined to vary much from the typical *ligamentina* of Lamarck; however, the Osage River contains some forms that are somewhat puzzling due to ecological conditions that erode the epidermis and distort the shell of this species (and of other characteristically rayed species, for that matter), but these are of rare occurrence in the Osage from the center of its course to its mouth. As mentioned elsewhere this local effect may be traced to the chemical reaction of the mineral water of the springs' region. There are no species it may be confused with

except *N. ellipsi formis* when the former is young. However, the more elliptic shell with broader, straighter rays would serve as the main distinguishing features. Surber (1913, p. 109) has found that its glochidium is a gill parasite upon the white bass (*R. chrysops*) as a natural host. Breeding records have been carefully kept for this species, especially for commercial reasons, to find that it is typically bradytictic.

Nephronaias ligamentina gibba (Simpson).

1900b—*Lampsilis ligamentinus gibbus* Simpson, Proc. U. S. Nat. Mus., XXII, p. 540.

("Southern Mucket," "Yellow Mucket.")

ANIMAL CHARACTERS:—Identical with those of the parent species, except, of course, in short gills and other modified parts due to a shorter shell. The glochidia are the same.

SHELL CHARACTERS:—Shell "peculiarly short, humped form" (Simpson); thicker, heavier more inflated with more roughened growth lines and more of a yellowish epidermis than the parent shell.

Sex	Length		Height		Diameter	Locality
♂	85	x	60	x	40mm	(Osage R., Monegaw Springs)
♀	80	x	64	x	40mm	(" " Linn Creek)
♀	89	x	70	x	38mm	(" " Bagnell)

MISCELLANEOUS REMARKS:—*Gibba* seems to be a rather common variety throughout the southern range of the species and is expecially characterized by the short, stout, "humped" form of shell. Perhaps it bears the same relation to its species as *dakotana* Frierson does to *grandis* Say. The writer's experience in the study of the form of *ligamentina* while on a 300-mile float down the Osage was that it was difficult to ascertain the point of separation between the species and the variety, *gibba*, so imperceptibly do they grade into each other. This form is met with in drainage of the Ozark Center as well—especially in the Black River.

Nephronaias ellipsiformis (Conrad).

("Ellipse.")

Pl. XXV, Figs. 86 A—D.

1836—*Unio ellipsiformis* Conrad, Monog. VIII, p. 60, pl. XXXIV, fig. I.

1845—*Unio spatulatus* Lea, Proc. Am. Phil. Soc., IV, p. 164.

1898—*Lampsilis spatulatus* Baker, Moll. Chicago, Pt. I, p. 106, pl X, fig. 5; pl. XIII, fig. 2.

1900b—*Lampsilis ellipsiformis* Simpson, Proc. U. S. Nat. Mus., XXII, p. 557.

ANIMAL CHARACTERS.

NUTRITIVE STRUCTURES:—Branchial opening with numerous yellowish papillae; anal very finely papillose; supra-anal small, high, closely but distinctly connected to anal; gills large, pointed even in the marsupial ones; inner laminae of inner gills connected entirely to visceral mass; palpi sickle-shaped; color of soft parts the usual dirty white with posterior mantle edges blackened.

REPRODUCTIVE STRUCTURES:—Marsupium occupying posterior half of outer gills, consisting of about twenty ovisacs separated by thick septa, when gravid extending below the original edge of sterile marsupium, tips pigmented with bluish, beaded spots; mantle edge antero-ventrad to branchial opening with papillae terminating in rather fine crenulations centrad-ventrad; conglutinates and glochidia unknown.

EXTERNAL STRUCTURES:—Shell small, elliptical, dorsal and ventral lines about the same curviture; post-umbonal ridge rather rounded; beaks very low, usually eroded, even in the youngest shells, thus sculpture not seen; epidermis brownish-yellow with bright waved rays all over disk; no sculpturing on disk; shells somewhat sexually dimorphic, the female being rather swollen post-ventrad.

INTERNAL STRUCTURES.—Cardinals strong, upright; interdentum large and thick; laterals short, stout, very slightly curved; beak cavities shallow; nacre white, sometimes with slight pinkish tinge and teeth rusty-red.

Sex	Length		Height		Diameter	Locality
♂	56	x	33	x	22.5mm	(Gasconade R., Gascondy)
♂	43	x	28	x	21.5mm	(Osage R., Warsaw)
♀	41	x	25	x	17.5mm	(" ", Proctor)
♀	35	x	22	x	7.5mm	(Niangua R., Hahatonka)

MISCELLANEOUS REMARKS:—This little striped shell is common throughout Central Missouri, but is never found anywhere in the interior north of the Missouri River and is rare in the southern drainage. Its shell may sometimes be taken for young *N. ligamentina;* however, the adult shells of these species are nothing alike. The anatomy of both are very similar; however, the inner mantle edge antero-ventrad to branchial opening is more specialized and indicates a step in advance. Hundreds of females were examined

daily throughout July and the first two weeks of August to find them sterile in every case. Since Wilson and Clark (1912, p. 48) report it gravid for an earlier date this incomplete breeding would indicate that it is bradytictic.

Nephronaias ellipsiformis venusta (Lea).

Not figured.

1838—*Unio venustus* Lea, Tr. Am. Phil. Soc., VI, pl. II, fig. 4.

1900b—*Lampsilis venustus* Simpson, Proc. U. S. Nat. Mus., XXII, p. 543.

ANIMAL CHARACTERS:—Entirely identical with those of the species both as to nutritive and reproductive structures. No glochidia have been found.

SHELL CHARACTERS:—Also identical with the typical *ellipsiformis*-shell except for a small guttered furrow just antero-parallel to post umbonal-ridge of shell. The male shell of this sub-species is also more pointed posteriorly than the male type species.

Sex	Length	Height	Diameter	Locality
♂	60	37	22mm	(Niangua R., Hahatonka)
♀	55	31	22mm	(" " ")

MISCELLANEOUS REMARKS:—The writer heartily agrees with Mr. Walker that *venusta* is very closely related to *ellipsiformis* and also with Mr. Frierson's opinion, that it is only a form of *ellipsiformis*. The type locality for *U. venustus* of Lea is Potosi, Washington County, Missouri, and belongs to the Meramec River basin. Simpson (1900b, p. 543) only reports it for that locality. Since then Rev. Wheeler has reported it for Arkansas; so has Wilson and Meek (1912. p. 19.). The writer has only found it in the Niangua River. Having such limited distribution and such lack of discriminating features from *N. ellipsiformis* there should be no hesitancy in naming *venusta as a variety.* From N. *pleasii* this subspecies differs by a ticker, heavier, more coarsely rayed and more of a tawny clolored shell.

Nephronaias Pleasii (Marsh).

("Bleeding Tooth," "Pleas' Shell.")

Pl. XXV, Figs. A—D.

1891—*Unio pleasii* Marsh, "The Observer" (a newspaper), II, May; Nautilus, V. p. 2.

1900b—*Lampsilis pleasii* Simpson Pr. U. S. Nat. Mus., XXII, p. 557.

ANIMAL CHARACTERS:—No females have been secured by the

writer; however, the nutritive structures of the males are identical with those of *N. ligamentina* and *ellipsiformis*.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell sub-elliptical, rather thin, smooth, somewhat compressed, rounded before, obtusely angular behind; beaks rather low, sculptured by three or four fine shaped undulations; epidermis brown polished horn, with numerous green capillary rays, disposed mostly posteriorly and showing through the thin shell on the inside.

INTERNAL STRUCTURES:—Cardinals small, single in right, double in left valve, erect and parallel with laterals; left interdentum cut away for post-cardinal tooth; beak cavities rather shallow; nacre bluish, coppery or salmon in umbonal cavity.

Sex	Length	Height	Diameter	Locality
♂	55	21	13 mm	(White R., Hollister)
♂	35.5	21.5	13.5mm	(" " ")
♂	30	18	12 mm	(James R., Galena)

MISCELLANEOUS REMARKS:—According to Mr. Marsh this shell bears some resemblance to Unio *spatulatus* Lea (i. e., *U ellipsiformis* Conrad), but differs chiefly in being thinner, smaller and more compressed. It is like *venusta* in that the female shell is deeply emarginate or constricted in front of post-umbonal ridge as the writer determines from the author's description (1891, p. 2). This species was dedicated to Mr. Elwood Pleas of Indiana who collected this Species, together with many other rare Species, from South Missouri. It was also collected by Mr. S. M. Godbey at Morrisville, Polk Co., Missouri, who sent it to the National Museum where it is now recorded under the number, 132634. The writer found *pleasii* as a rather common shell in the White River, this State.

Nephronaias ozarkensis (Call).

("The Ozark Shell.")

(*Not figured.*)

1887—*Unio ozarkensis* Call, Pr. U. S. Nat. Mus., X, p. 498, pl. XXVII; 1895, Tr. Ac. Sci. St. Louis, VII, pp. 33-34, Pl. XVIII.

1900b—*Lampsilis ozarkensis* Simpson, Pr. U. S. Nat. Mus., XXII, p. 557.

ANIMAL CHARACTERS:—Reference to rough field notes show

that the sof parts are those of Nephronaias. The shell was identified later as *ozarkensis* of Call.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell sub-elliptical, smooth, rather compressed; post-umbonal slope somewhat biangulate by siphonal ridges; beaks not prominent, sculptured by three fine undulations; epidermis brownish-yellow or olive with numerous fine green rays over central portion of disk; sexually dimophic.

INTERNAL STRUCTURES:—Cardinals tend to double in both valves, laterals rather short, slightly curved; nacre usually white, sometimes salmon or pink, irridescent; muscle scars confluent.

Sex	Length	Height	Diameter	Locality
♀	55.0 x	35.0 x	21.0	(Jack's Fork, Current R.)
♂	54.5 x	32.7 x	15.2	(Jack's Fork, Current R.)

MISCELLANEOUS REMARKS:—The latter measurement is that of Call's taken for a shell from the same locality (which is one of the type localities of *ozarkensis*) as for the shell of the first measurement which is now in the hands of the writer through the kindness of Mr. B. F. Bush, but which is now too much damaged through shipment for figuring. Its shell is very much like that of *N. pleasii* as to general outline, but is a little thicker and has a different nacre and epidermis. Forms of this Species reported by Meek and Clark (1912, p. 18) for the White River drainage and described as like "a very elongated *Quadrula coccinea*" and also identified by Mr. Walker as "*Pleurobemae* rather than species of *Lampsilis*" are doubtless only *Pleurobemae utterbackii of* Frierson. Definite assignment to the latter may be made for shells received from the White River, Hollister, Missouri, under the name of *ozarkensis* with the note:—"although not having *Lampsiline* beak sculpture." The reader is invited to compare descriptions and illustrations of *Neph. ozarkensis* and *Pleu. utterbackii* and note that the shell of the former does not possess such tumid beaks, nor such a furrowed post-slope, nor such distinct muscle scars, and its shell has its whole facies of a thinner, lighter character, thus being more inclined to a *Lampsiline* structure.

Genus **Amygdalonaias** Crosse and Fischer.

1893—*Amygdalonaias* Crosse and Fischer, Jour de Conch., pp. 31-32; 1900b,—Simpson, Proc. U. S. Nat. Mus., XXII, p. 604 (as subgenus for *Plagiola*).

(*Type, Unio cognatus* Lea.)

ANIMAL CHARACTERS:—Anal opening crenulated; supra-anal widely separated from anal; inner laminae of inner gills connected to visceral mass except for a small posterior slit; palpi small; marsupia consisting of several ovisacs at posterior half of outer gill that acutely tapers; conglutinates white, undivided; glochidia smallest of all *Naiades*.

SHELL CHARACTERS:—Shell among the smallest, roundly triangular, inflated, flattened on post-dorsal slopes; post-umbonal ridge sharply angular; disk smooth; beak rather full, sculptured with a few ridges, the latter ones being rather definitely double looped; epidermis greenish to yellowish with characteristic paintings of green arrow-marked rays; female shell slightly more inflated post-ventrad; hinge teeth delicate; nacre usually white.

MISCELLANEOUS REMARKS:—Although this genus stands very close to *Obovaria* and *Nephronaias*, having essentially identical structures of soft parts, yet it deserves this compartment on account of its unique form, size and color markings of shell and especially upon its glochidial characters, being the smallest on record. The only two members of this genus are represented in this State by *A. donaciformis* (Lea) in North Missouri and by *truncata* (Raf.) in Central Missouri. The latter is never found north of the Missouri River and the former is rarely ever found in Central Missouri; neither have been found by the writer in South Missouri. The Osage River bears many intergrades for these two species.

Amygdalonaias donaciformis (Lea).

("Fawn's Foot," "Deer-Toe," "Zigzag.")

Pl. XXV, Figs. 89 A—D.

1828—*Unio donaciformis* Lea, Tr. Am. Phil. Soc., III, p. 267, pl. IV, Fig. 3.

1820—*Unio zigzag* Lea, Tr. Am. Phil. Soc., III, p. 440, p. XII, fig. 19.

1898—*Plagiola donaciformis* Baker, Moll. Chicago, Pt. I, p. 92, pl. XIII, fig, 4; 1900b, Simpson, Proc. U. S. Nat. Mus., XXII, p. 605.

ANIMAL CHARACTERS.

NUTRITIVE STRUCTURES:—Branchial opening small with numerous papillae; anal indistinctly crenulated; supra-anal separated by a long and thick mantle connection to anal; inner laminae connected to visceral mass except for a narrow slit

anteriorly; palpi small, connected one-half of their length antero-dorsad; color of soft parts dirty white except for blackish mantle edge at siphonal openings.

REPRODUCTIVE STRUCTURES:—Marsupia rather low on post-ventral portion of outer gills; when gravid the numerous distinct ovisacs extend below the original edge of gill; glochidia *smallest on record, measuring 0.600 x 0.063 min., semicircular, spineless, hinge line short, very slightly undulated;* conglutinates white, loosely connected when glochidia mature.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell very small, compressed, rounded before, pointed high behind; post-umbonal ridge rather prominent; disk smooth; beaks rather full sculptured by five upward angled bars extending out as finer concentric lines in later bars; epidermis green or olivaceous, painted with radiating green rays of zigzag or arrow-marks; female shell inflated post-ventrad.

INTERNAL STRUCTURES:—Cardinals double in left, single in right valve, compressed, high and ragged; interdentum narrow; laterals single in right, faintly double in left; nacre pearl blue or white. rarely pink.

Sex	Length	Height	Diameter	Locality
♂	54	30	22mm	(Grand R., Gallatin)
♀	35	22	15mm	(Platte R., Dixon Falls)
♀	33	20	14mm	(" " Agency Ford)
♂	14	8.5	9.5mm	(Grand R., Darlington)
♀	11	7.0	4.5mm	(" " Chillicothe)

The last two are among the smallest juveniles in the writer's collection. The smallest meets with the following description:—Post-umbonal ridge sharply angled; beaks prominent, well up toward middle of dorsal line, sculptured by five early bars bowed upward in the center, the latter ones being rather fine, concentric; epidermis green with costa-like paintings on the post-dorsal ridge; disk with two rows of zigzag paintings parallel to the growth lines. Four juveniles of this species were found in the Osage clinging to one byssal thread, but unfortunately they were lost.

MISCELLANEOUS REMARKS:—Typical *donaciformis* may be easily distinguished from *Amyg. truncata* in possessing a smaller shell, more painted, thinner, less inflated, more dorsally ridged, and is more of an inhabitant of quiet water with mud-sand bottom. *Donaciformis* is more supplanted in Central Missouri by *truncata*

(Raf.), but, as stated before, it takes the place of the latter wholly in North Missouri. The North Missouri Grand River bears *donaciformis* in its most typical form. The writer finds this species most colonial in their habits, and has been able to find many of them nearly every month of the year, but has not found any gravid during the winter. The earliest date for the bearing of glochidia is June 19th. No previous public record has ever been made of this unique glochidium. From the above data it may be inferred that it is not bradytictic as is mostly the breeding habit of the *Lampsilinae*. This little mussel is also eccentric in that while in the parasitic stage it develops an adult shell five times the size of the glochidial one. Surber (1913, p. 109) finds that its specific distributor is "Sheep's Head" (*A. grunniens*).

Amygdalonaias truncata (Rafinesque).

("Deer-Foot," or "Deer-Toe.")

XXV, Fig. 88 A and B.

1820—*Unio truncata* Rafinesque, Ann. Gen. Sci. Phys. Brux.

1831—*Unio elegans* Lea, Am. Phil. Soc., IV, p. 83., pl. fig. 13.

1898—*Plagiola elegans* Baker, Moll. Chicago, Pr. I, p. 91, pl. XXI, fig. 1; 1900b, Simpson, Pr. U. S. Nat. Mus., XXII, p. 604.

1912b—*Amygdalonaias elegans* (Lea) Ortmann, An. Car. Mus., XXII, p. 328.

ANIMAL CHARACTERS.

NUTRITIVE STRUCTURES:—Identical with those of *donaciformis*.

REPRODUCTIVE STRUCTURES:—Branchial mantle margin a little more thickened with slight crenulations than in *donaciformis;* glochidia a little larger, measuring 0.060 x 0.070 mm—otherwise these structures are identical with those of *donaciformis*.

SHELL STRUCTURES.

EXTERNAL STRUCTURES:—Shell short, roundly triangular, inflated; post-umbonal ridge sharply angulated from beaks to posterior point of shell; disk smooth; beaks rather prominent, sculptured with a few fine ridges more or less double-looped or sinuated; epidermis yellowish, brownish or even grreenish with beautiful paintings of green broken by arrow-marked rays; no sex dimorphism of shell, both sexes being rather swollen post-ventrad.

INTERNAL STRUCTURES:—With the exception of a deeper and

more rounded out branchial cavity and somewhat coarser cardinals these structures are identical with those of *donaciformis*.

Sex	Length		Height		Diameter		Locality
♂	50	x	36	x	25	mm	(Osage R., Linn Creek)
♀	43	x	34	x	23	mm	(Gasconade R., Gascondy)
♀	38	x	30	x	17	mm	(Osage R., Schell City)
♂	37	x	27	x	16.5	mm	(" " Proctor)

MISCELLANEOUS REMARKS:—As pointed out under the description of *donaciformis*, *truncata* is as distinct when typical as its only con-generic ally—especially in its broadly truncated shell post-dorsad. Neither is *truncata* so sexually dimorphic; however, the male shell is unusually more elongated and pointed posteriorly and has less inflation. Both sexes have their shells rather expanded post-ventrad. This species is rarely found in South Missouri, (the writer not having made personal collections of it there at all) although it is really more of a southern species than *donaciformis*. It is not to say very typical in the Osage or Gasconade basins where there are many intergrades for it and its ally, but reaches its greatest perfection in the Mississippi. The breeding habits of this species is the same as that of *donaciformis* as far as records show.

Genus **Plagiola** Rafinesque.

1819—*Plagiola* Rafinesque, J. de Phys. Chim. Hist. Nat., p. 426; 1852, Agassiz, Arch, Fur Nat., p. 48, (redefined); 1900b, Simpson, Pr. U. S. Nat. Mus., XXII, p. 603.

(Type, *Unio securis* Lea.)

ANIMAL CHARACTERS:—Anal opening smooth, connected to supra-anal by close mantle attachment; inner laminae of inner gills free or partly connected to visceral mass; gills brownish—all other soft parts tannish; marsupium rather reniform consisting of 40-50 well defined ovisacs; conglutinates lanceolate, not very solid; glochidium spatulate, very much higher than long, spineless, very large.

SHELL CHARACTERS:—Shell sub-triangular, solid, not greatly inflated, with square cornered post-umbonal ridge and flat post-dorsad; disk smooth; beaks pointed, rather high, sculptured with faint double-looped ridges; epidermis yellow with broken rays; cardinals low and jagged; laterals rather stout, straight or slightly curved; nacre white.

MISCELLANEOUS REMARKS:—The chief characteristic of this

genus is in its peculiar shell and glochidial characters. As to its animal characters it is essentially that of *Obovaria* and *Amygdalonaias*. Because of its spatulate and higher-than-long glocidia there is "a transition," as Dr. Ortmann aptly puts it, "toward the glochidia of the *Proptera-type*," which has essentially the same hinge line and rounded ventral margin, but with different posterior and anterior ends.

Plagiola securis (Lea).

(Butterfly.")

Pl. II, Figs. 5a—6b.

1829—*Unio securis* Lea, Tr. Am. Phil. Soc., III, p. 437, pl. XI, fig. 17.

1834—*Unio lineolata* Say,[1] Am. Conch., VI.

1900b—*Plagiola securis* (Lea) Simpson, Proc. U. S. Nat. Mus., XXII, p. 603.

ANIMAL CHARACTERS.

NUTRITIVE CHARACTERS:—Branchial opening rather small with numerous papillae; anal crenulated; supra-anal very large closely, but definitely connected by mantle edges to anal; anus tentacled; inner laminae of inner gills free about three-fourths of their length from the visceral mass; palpi large, connected one-third of their length antero-dorsad; color of soft parts tan, or cream color with gills brownish and papillae yellowish.

REPRODUCTIVE STRUCTURES:—Marsupium composed of about twenty-five ovisacs placed in the posterior half of outer gill; mantle border antero-ventrad to branchial opening with about fifteen very low, irregularly placed papillae; marsupium when charged with ripe glochidia color of brown sugar, somewhat kidney shaped; conglutinates not very solid; glochidia subelliptic or spatulate hinge line very short, ventral margin round, spineless, much higher than long (0.230 x .330mm).

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell sub-triangular, not very much inflated, compressed in umbonal region, truncated narrowly post-dorsad; disk more or less smooth; beaks somewhat pointed and directed anteriorly, sculptured with a few fine concentric

[1] This name, as employed by Say, was really preoccupied by Rafinesque in his Monograph of 1820 and hence through priority this species should bear the name *Plagiola lineolata* (Raf.) in spite of the fact that Simpson considered this as one of the many "indeterminates" of Rafinesque.

and indistinctly double-looped ridges; post-umbonal ridge square cornered from beaks to post-extreme; epidermis yellowish or light brown painted with rays broken into square or lunate blotches; female shell smaller, thicker, shorter and more inflated than male.

INTERNAL STRUCTURES:—Cardinals rather low, ragged the the right one having four vertical subparallel ridges; interdentum broad; laterals stout, rather long and sharply inclined; beak cavities, moderately deep; nacre silvery white, irridescent.

Sex	Length	Height	Diameter	Locality
♂	96 x	79 x	33mm	(Merame R., Meramec Highlands)
♀	70 x	56 x	37mm	(Marais des Cygnes, Athol)
♀	67 x	53 x	30mm	(Miss. R., Hannibal)
♂	48 x	36 x	16mm	(" " LaGrange)

MISCELLANEOUS REMARKS:—*P. securis* being more of a marine type of shell than fresh water renders it worthy of the creation of a genus. The young shell is like that of an "exquisite shell from the sea-shore," so narrowly flattened is it post-dorsal portion of shell, so delicately painted with broken lunate rays and so arched forward are its compressed and pointed umbones. This species is not found at all in the interior north of the Missouri River; neither is it found in Southwest Missouri. It is rather common in the Osage, Gasconade and Meramec though not very typical as a rule. The most perfect *securis* is the Mississippi. The writer found this species from the Mississippi bearing ripe glochidia June 22nd; Wilson and Clark (1914, p. 52) found the Cumberland *securis* in the same gravidity June 3–16. Dr. Ortmann finding it gravid in late fall again fixes its breeding season as normally bradytictic.

Genus **Lasmonos** Rafinesque.

1820—*Lasmonos* Rafinesque, Monograph, Ann. Gen. Sci. Phys. Brux.
1911b—*Paraptera* Ortmann, Mem. Car. Mus., IV pp. 331, 334, 338.

(Type, *Lasmonos fragilis* Rafinesque.)

ANIMAL CHARACTERS:—Siphonal openings large inclined to be tubular; supra-anal high, well separated from anal; inner laminae of inner gills entirely connected to visceral mass; palpi free their whole length post-dorsad, color of soft parts grayish with yellowish papillae on blackened mantle edge or branchial opening; marsupium kidney-shaped, consisting of several ovisacs occupying posterior part of outer gills; conglutinates white, leaf-like, not

very solid; glochidia very small, sub-ovate; spineless, hinge line short, slightly curved.

SHELL CHARACTERS:—Shell thin, sub-elliptical, alated, compressed; post-umbonal ridge lacking; disk smooth; unbones low marked with fine concentric lines followed by later double-looped bars; epidermis glistening tawny, rayed; sex-dimorphism shown in wider more blunt vertically at posterior end of female shell; hinge teeth reduced to rudiments.

MISCELLANEOUS REMARKS:—This genus is also constructed on the basis of characters relating to shell and glochidia rather than to anatomical structures. On basis of glochidial characters alone it classes with *Amygdalonaias;* however its shell characters throw it near to the genus *Proptera. Lasmonos* is represented in this State by its type (which is the commonest shell in North Missouri) and by *simpsoni* Feriss. The latter is grouped here tentatively until its soft parts are studied as its shell characters more closely relate it to the type of this genus than to any other. The species, *Leptodea leptodon* Rafinesque, is perhaps congeneric here and much depends upon its marsupial and glochidial characters, which are as yet unknown; however, the writer has not been fortunate enough to secure live specimens of this species (not even dead shells) in this State, but, because of the use Rafinesque made of it, we are concerned here for nomenclatural reasons, *for should it be found to be really congeneric with fragilis, aside from its several shell characters, the generic name, Leptodea, would take preference to the one herein used.*

Lasmonos fragilis Rafinesque.
("Paper Shell," "Razor Back.")
Pl. IX, Fig. 19; Pl. XXVI, Figs. 90 A—D.

1820—*Lasmonos fragilis* Rafinesque, Mono. Biv. of Ohio.
1823—*Unio gracilis* Barnes, Am. Jl. Sci., VI, p. 274.
1861—*Unio dolosus* Lea, Jl. Phil. Ac., V, p. 75.
1900b—*Lampsilis gracilis* Simpson, Pr. U. S. Nat. Mus., XXII, p. 573.
1912b—*Paraptera gracilis* Ortmann, An. Car. Mus., VIII, p. 331.

ANIMAL CHARACTERS.

NUTRITIVE STRUCTURES:—Branchial opening round, with spreading, yellowish tentacles; anal slightly crenulated, with thickened edges and normal diaphragm; supra-anal long, extending to dorsal ala, usually closed; mantles parallel at edges, dark colored

and thickened on edges of siphonal openings, white patch at base of branchial papillae, crenulated along border in front of branchial opening, post-ventral region of mantle darker than that of female; palpi united only at base, very long in old specimens; foot large, powerful, very extensile; gills dark tan, pointed posteriorly, inner gills longer and broader than outer, inner laminae of inner gills entirely connected to visceral mass.

REPRODUCTIVE STRUCTURES:—Marsupia occupying posterior part of outer gill, reniform, consisting of about forty, leaf-like ovisacs and, when gravid, extending beyond original edge of gills, the extreme thickness of tissue here allowing the bulging out until glochidia escape through the ruptured edge; conglutinates white, elongate, leaf-shape, not very solid, usually surrounded with brick-red matter; glochidia among the very smallest (0.085mm. by 0.075mm.) belonging to the *Lampsilis* type (i. e., semi-elliptical, ventral margin rounded, gaping, hookless, short hinge line which is slightly undulate.)

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell medium in size, thin, alate, posterior end of female shell blunt; beaks compressed, marked with three or four wrinkles arranged in a double loop ending with two or three rather nodulous elevations at the base of the post-umbonal slope; epidermis straw color with bright green rays in young and well preserved specimens.

INTERNAL STRUCTURE:—Cardinal teeth very weak, single in each valve; lateral teeth more solid, long, lamellar, elevated, no interdentum; muscle scars faint, retractor large and peculiarly placed; beak cavity shallow; nacre pearl-blue with the usual characteristic pink on the posterior portion.

Sex	Length		Width		Diameter	Um. ra.	Locality
♀	80	x	40	x	23	0.250	(Perche Cr., Columbia)
♂	140	x	70	x	47	0.210	(Grande R., Utica)
♀	74	x	38	x	26	0.275	(Platte R., Agency Ford)
♀	70	x	37	x	25	0.283	(102 R., St. Joseph)
	21.5	x	11	x	5.5	0.260	(Osage R., Colley's Ford)

BYSSIFEROUS JUVENILE:—The latter measurement is taken from a juvenile collected in the Osage River, Colley's Ford Mo., July 15, 1913. It possessed a bysuss 160mm. long and was attached to a plicate shell. This byssal thread was so strong that it pulled off with some difficulty and was split in three strands near its

base, each being marked by a muscilaginous substance. The umbonal markings of this flat straw-colored juvenile shell consists of four broadly inverted V-shaped ridges the rear line being finer, longer and closer together, extending down the posterior umbonal ridge.

MISCELLANEOUS REMARKS:—*L. fragilis* is distinctly a river form for this State, although we would naturally think that this alated and thin-shelled species would be established in the lakes and other quiet waters of Northwest Missouri, especially where it predominates the streams. Breeding records for this species show that it may bear glochidia every month of the year except for a few weeks in mid-summer; hence, a very long period breeder. It was found in August distending its ovisacs with water preparatory to ovulation. Only two other species possess smaller glochidia—those of *Amygdalonajas donaciformis* (Lea) and *A. elegans* (Lea) with which *fragilis* is closely related; however, external characters of shell alone—especially as to size and form—show no close connection. *Fragilis* may be distinguished from other similar alated forms by its peculiar yellow surface, marked by brown horn-colored restlines, depressed umbones, green rays in young and broadly elliptical outline in old specimens, if their alae are lost as is often the case. Through special cooking tests the writer has found out that nearly all the soft parts of this species is very edible. It is also economically important in producing pearls, since it is easily parasitized. No mussel is more active and as it anchors itself so firmly it is often extracted from its bed with great difficulty. The straw-colored and green rayed juveniles are easily located, not so much by color as by their "tracks" since they are the most active crawlers. This species is the most abundant in the One-Hundred-and-Two, Platte, Grand, Tarkio, Osage—in fact all the streams of Northwest and Central Missouri as determined by personal collections. It is poorly developed in the Osage and is not found at all further South in the clear-water streams of the Ozarks. Simpson reports it for the Missouri River, but I think he means only for the tributaries of the Missouri as no mussel life is actually reported in the main stream of this River throughout the State. Its general distribution is for the entire Mississippi River drainage; St. Lawrence system; Red River of the North; Eastern Texas and Cumberland River.

(*To be continued.*)

ENUMERANTUR PLANTAE DAKOTAE SEPTENTRIONALIS VASCULARES.—V.

ENUMERAVIT J. LUNELL.

The Vascular Plants of North Dakota.—V.

With Notes by J. Lunell.

Family 43. **ALSINEAE** Bartling, Ord. Nat. p. 304. (1830).

ALSINE Dioscorides IV: 75. Plinius XXV: 11. Tour. Êls. p. 208. (1694). Linn. Syst. (1735.) and Gen. (1737).

Stellaria Linn. Gen. (1737) and (1754).

421. **Alsine media** Fuchs. Hist. Stirp. p. 106. (1546).

Turtle Mountains: St. John.

422. **Alsine longifolia** (Muhl). Britton in Mem. Torr. Bot. Club 5: 150. (1894).

Stellaria longifolia Muhl., Willd. Enum. Hort. Berol. 479. (1809).

Peninsula of Lake Ibsen, Butte, Towner, Pleasant Lake, Turtle Mountains.

423. **Alsine longipes** (Goldie) Coville, Contr. Nat. Herb. 4: 70 (1893).

Stellaria longipes Goldie, Edinb. Phil. Jour. 6: 327. (1822).

Leeds, Butte, Thorne.

424. **Alsine crassifolia** (Ehrh.) Britton. Mem. Torr. Bot. Club 5: 150. (1894).

Stellaria crassifolia Ehrh. Hannov. Mag. 8: 116. (1784).

Spring in ravine, Butte.

425. **Alsine borealis** (Bigel.) Britton, Mem. Torr. Bot. Club 5: 150. (1894).

Stellaria borealis Bigel. Fl. Bost. Ed. 2: 182. (1824).

Pleasant Lake.

CERASTIUM Dillenius, Cat. Pl. Giss. p. 41, etc. (1718).

426. **Cerastium oreophilum** Greene, Pittonia 4: 297. (1901).

Leeds, Butte, Minot.

427. **Cerastium brachypodum** (Engelm.) Robinson in Britton, Mem. Torr. Club V: 150. (1894).

Cerastium nutans brachypodum Engelm. in A. Gray, Man. Ed. V: 94. (1867).

Dickinson (Cl. Waldron).

428. **Cerastium longipedunculatum** Muhl. Cat. Pl. 46. (1813).
Cerastium nutans Raf. Préc. Somiolog. 36. (1814).
Turtle Mountains: St. John.
MOEHRINGIA Linn. Gen. 162. (1742), 170. (1754).
429. **Moehringia lateriflora** (Linn.) Fenzl. Verbr. Alsin. table, p. 18. (1833).
Arenaria lateriflora Linn. Sp. Pl. 423. (1753).
Willow City, Peninsula of Lake Ibsen, Towner, Minot, Devil's Lake, Turtle Mountains.
SPERGULA Linn. Sp. Pl. 440. (1753).
430. **Spergula arvensis** Linn. l. c.
Leeds.
Family 44. **CARYOPHYLLEAE** B. Juss. Hort. Trianon (1759), Jussieu, Gen., LXVII, and 299. (1789).
GITHAGO Tragus, Hist. 1552; Adans. II: 255. (1763).
431. **Githago segetum** Link, Diss. Bot. Suerin., 62. (1795).
Agrostemma Githago Linn. Sp. Pl. 435. (1753).
Lychnis segetum C. Bauhin, Pinax, p. 204. (1623).
Leeds, Butte.
432. **Githago segetum** var. **nanum** (Hn) Lunell.
Agrostemma Githago var. *nanum* Hartman in Neuman, Sveriges Flora 527. (1901).
Butte, among the type.
SILENE Lobelius, Obs. p. 242. (1576). Linn. Syst. (1735), etc.
433. **Silene antirrhina** Linn. Sp. Pl. 419. (1753).
Willow City (Bottineau County).
434. **Silene antirrhina depauperata** Rydb.
Towner.
435. **Silene noctiflora** Linn. Sp. Pl. 419. (1753).
Leeds, Butte.
VAHLBERGELLA Fries. Bot. Notiser. 143. (1843).
Vahlbergella Blytt, Norges Flora, III, 1070 (1876).
436. **Vahlbergella Drummondii** (Hook.) Rydb. Bull. Torr Bot. Club. 39: 318 (1912).
Silene Drummondii Hook. Fl. Bor. Am. I: 89. (1830).
Lychnis Drummondii S. Wats. in King. Geol. Exp. 5:37. (1872)
Leeds, Butte, Dunsieth, Towner.
GYPSOPHILA Linn. Sp. Pl. 406. (1753).
437. **Gypsophila elegans** Beib.
An occasional escape, Leeds.

VACCARIA Dodonaeus, Pempt. I: 4, 20. (1583).

438. **Vaccaria vulgaris** Host. Fl. Anst. 1: 518. (1827.)

Saponaria Vaccaria Linn. Sp. Pl. 409. (1753).

Leeds, Butte.

DIOSANTHOS Theophrastus, Hist. VI: 1, 6. Bubani, Fl. Pyr. III: 89. (1901).

439. **Diosanthos barbatum** St. Lager. Ann. Soc. Bot. Lyon. VII: 87 (1880), Bubani l. c. p. 93.

Dianthus barbatus Linn. Sp. Pl. 409. (1753).

Occasionally escaped, Leeds.

Order 22. RANALES.

Engler in Eng. & Prantl. Pflnzfm. Nachtr. p. 347 (1897).

Family 44. **CERATOPHYLLEAE** D. C. Prodr. III. p. 73. (1828).

DICHOTOPHYLLUM Dillenius, Nov. Gen. p. 91. (1719).

440. **Dichotophyllum demersum** (Linn.) Moench, Meth. p. 345. (1794).

Ceratophyllum demersum Linn. Sp. Pl. 992.(1753).

Leeds (extinct).

Family 45. **NYMPHAEEAE** Salisbury, Koenig and Sims, Ann. Bot. 1: 70. (1806).

NYMPHONA Marcellus Virgilius, Comm. Diosc. p. 440. (1529).

441. **Nymphona advena** (Soland.) Nwd. Am. Midl. Nat. Vol. III. p. 295. (1914).

Nymphaea advena Soland. Ait. Hort. Kew. II: 226. (1789).

Nuphar advenum R. Br. Ait. Hort. Kew. ed 2, III: 295. (1811).

Jamestown (Bergman).

Family 46. **RANUNCULACEAE** L. Gerard, Fl. Gallopr p. 378. (1761).

RANUNCULUS Plinius XXV: 13. Tour. Els. p. 240. (1694).

442. **Ranunculus eremogenes** Greene, Erythaea 4:121. (1896).

Ranunculus sceleratus eremogenes, Cockerell, Univ. Mo. Stud. Sci. II 2: 124. (1911).

Leeds, Oberon, Dunseith.

443. **Ranunculus eremogenes longissimus** Lunell in Am Midl. Nat. Vol. I. p. 206. (1910).

In coulée, Leeds. Became extinct, when the coulée dried up permanently.

444. **Ranunculus eremogenes pubescens** Lunell in Bull. Leeds Herb. no. 2, p. 6. (1908).

Leeds, Oberon.

445. **Ranunculus limosus** Nutt., T. & G. Fl. N. Am. I. p. 20. (1838).

Ranunculus Purshii Richards. var *geranioides* Lunell in Bull. Leeds Herb. no. 2, p. 6. (1908).

Besides the type, the specimen in my herbarium is the only representative of Nuttall's plant known to be in existence.

Leeds (extinct).

446. **Ranunculus eremogenes X limosus.**

Ranunculus Purshii Richards. var. *dissectus* Lunell in Bull. Leeds Herb. no. 2, p. 6. (1908).

Leeds (extinct).

447. **Ranunculus Purshii** Richards. var. **polymorphus** Lunell in Bull. Leeds Herb. l. c.

Peninsula of Lake Ibsen (extinct).

448. **Ranunculus Purshii** Richards. var. **schizanthus** Lunell in Bull. Leeds Herb. l. c.

Leeds (extinct).

449. **Ranunculus Purshii** Richards. var. **humifusus** Lunell, nomen novum.

Ranunculus Purshii Richards. var. *radicans* Lunell in Bull. Leeds Herb. l. c.

Ranunculus radicans Regel, Bull. Soc. Nat. Mosc. XXXIV pt. 2, 44. 45, *not* of C. A. Meyer & Ledeb.

Leeds (extinct), Peninsula of Lake Ibsen (extinct).

450. **Ranunculus delphinifolius** Torr.: Eaton, Man. ed. 2. 395. (1818).

Ranunculus multifidus Pursh, Fl. Am. Sept. 736. (1814), *not* Forsk. (1775).

Fargo (Bergman).

451. **Ranunculus abortivus** Linn. Sp. Pl. 551. (1753).

Leeds, Towner, Devils Lake.

452. **Ranunculus abortivus eucyclus** Fernald.

Devils Lake.

453. **Ranunculus pennsylvanicus** Linn. fil. Suppl. p. 272. (1781).

Leeds, Peninsula of Lake Ibsen, Turtle Mountains; Kulm (Brenckle).

454. **Ranunculus Macounii** Britton, Trans. N. Y. Acad 12: 3. (1892).

Ranunculus hispidus Hook. Fl. Bor. Am. I: 19. (1829), *not* Michx. (1803).

Leeds, Minnewaukan.

455. **Ranunculus Macounii X pennsylvanicus.**

Devils Lake.

456. **Ranunculus acer** Linn. Sp. Pl. 554. (1753), cor. Host.

Ranunculus acris Linn. l. c.

Max in McLean County (O. A. Stevens).

457. **Ranunculus ovalis** Raf. Proc. Dec. 36. (1814).

Ranunculus rhomboideus Goldie, Edinb. Phil. Journ. 6. 329. (1822).

Leeds, Butte, Dunsieth, Towner.

458. **Ranunculus Waldronii** Lunell in Am. Midl. Nat. Vol. III, p. 12 and 13. (1913).

Dickinson (Cl. Waldron).

BATRACHIUM S. F. Gray, Nat. Arr. Br. Pl. II: 720. (1821).

459. **Batrachium circinatum** (Sibth.) Rchb., Spach. Hist. Veg. VII, p. 201. (1839).

Ranunculus circinatus Sibth.; J. E. Smith, Fl. Brit. 2: 596. (1800).

Leeds, Devils Lake; Valley City (O. A. Stevens).

460. **Batrachium circinatum terrestre** Lunell.

A form growing on low land where water once was, but later dried up.

Leeds.

HALERPESTES Greene, Pitt. IV, 207 (1900)

461. **Halerpestes Cymbalaria** (Pursh) Greene, in Pittonia 4: 208. (1900).

Ranunculus Cymbalaria Pursh. Fl. Amer. Sept. 392. (1814).

Oxygraphis Cymbalaria Prantl. in Engl. & Prantl, Pflanzenfamilien, 32: 63. (1891).

Leeds, Devils Lake.

AIOLON Lunell, nom. nov. (gr. Αἴολος, Aeolus, the God of the winds).

Nemorosa Ruppuis, Fl. Jenensis, p. 128. (1726). (1718). This word means woody, sylvan, and is a plain adjective, not substantive. Furthermore, the name is misleading as far as our State is concerned, our species belonging to the prairie. These

have been considered good reasons for the change of genus name.

462. **Aiolon canadense** (Linn.) Nwd. & Lll.

Nemorosa canadensis (Linn.) Nwd. in Am. Midl. Nat. Vol. III, p. 322. (1914).

Anemone canadensis Linn. Syst. Ec 12. III. App. p. 231. (1768). *Anemone pennsylvanica* Linn. Mant. II. 247. (1771).

Leeds, Pleasant Lake, Towner; Kulm (Brenckle).

463. **Aiolon canadense flavum** Lunell, forma nova.

Petalis parvis, flavis. Planta rara.

A sporadic form with small, yellow petals.

Church's Ferry.

ANEMONE Theophrastus; Tour. Els. 238. (1694).

464. **Anemone Hudsoniana** Richardson. Franklin's 1st Journey ed. II, App. 22.

Butte (very rare).

465. **Anemone virginiana** Linn. Sp. Pl. 540. (1753).

Devils Lake, Dunsieth, St. John.

466. **Anemone cylindrica** A. Gray. Ann. Lyc. 3: 221. (1836).

Leeds, Butte, York, Pleasant Lake.

PULSATILLA Adanson, Fam. Pl. 2: 460. (1763).

467. **Pulsatilla hirsutissima** (Pursh) Britton, Ann. N. Y. Acad. 6: 217. (1891).

Clematis hirsutissima Pursh. Fl. Am. Sept. 385. (1814).

Pulsatilla Ludoviciana (Nutt). Heller (?).

Anemone Nuttalliana DC. Reg. Veg. Syst. I: 193. (1818).

The flowers are of two kinds: 1. Those appearing before the leaves in the earliest spring, with *bright* sepals of many different shades. Common. 2. Those appearing with or after the leaves during the whole summer, but only sporadically, with sepals of a *pale* or faded, white or whitish color. Leeds, Butte.

CLEMATIS Dioscorides IV: 182. Plinius XXII: 10.

468. **Clematis virginiana** Linn., Amoen. Acad. 4:275. (1759).

Fargo (Bergman & Stevens).

MYOSORUS Linn. Sp. Pl. 284. (1753).

469. **Myosurus minimus** Linn. l. c.

Dickinson (Cl. Waldron).

Family 44. **THALICTRACEAE** Greene, Leaflets II: 49. (1910).

LEUCOCOMA (Greene) Nwd. in Am. Midl. Nat. III. p. 253. (1914).

470. **Leucocoma albens** (Greene). Lunell.

Thalictum albens Greene, in Am. Midl. Nat. Vol. II, p. 292. (1912).

Valhalla (L. R. Waldron).

471. **Leucocoma Lunellii** (Greene) Lunell.

Thalictrum Lunellii Greene in Am. Midl. Nat. Vol. I, p. 102. (1909).

Minot, Towner.

472. **Leucocoma thyrsoidea** (Greene) Lunell.

Thalictrum thyrsoideum Greene in Am. Midl. Nat. Vol. I, p. 102. (1909).

Leeds, Butte, Dunsieth.

473. **Leucocoma thyrsoidea silvana** Lunell.

Thalictrum thyrsoideum silvanum Lunell, in Am. Midl. Nat. Vol.. II. p.j157. (1911).

Peninsula of Lake Ibsen, Devils Lake, Pleasant Lake, Towner, Turtle Mountains.

474. **Leucocoma vegeta** (Greene) Lunell.

Thalictrum vegetum Greene in Am. Midl. Nat. Vol. I. p. 103. (1909).

Devils Lake, Peninsula of Lake Ibsen, Turtle Mountains, Towner, Minot, Pleasant Lake.

Family 45. **HELLEBORACEAE** Loiseleur–Delongchamps, Man. Pl. Us. (1819).

AQUILEGIA Fuchs. Hist. Stirp. p. 39. (1546).

475. **Aquilegia canadensis** (Cornuti) Linn. Sp. Pl. 534. (1753.)

Turtle Mountains.

POPULAGO Tabernaemontanus, Neeuw. Kreuterb. p. 118. (1590). Tour. Els. p. 238. (1694). Moench. Meth. p. 250. (1794). *Caltha* Linn., *not* of the older botanists, which is =*Calendula*.

476. **Populago palustris** (Linn.) Moench. l. c.

Caltha palustris Linn. Sp. Pl. 588. (1753).

Sheyenne, Pleasant Lake, Granville.

PLECTRORNIS, Raf., Med. Fl. II, 216 (1830).

(An nomen nudum?)

Delphinastrum Spach, Hist. Nat. Veg. VII, p. 336 (1839) not desirable as built on another plant name.

477. **Plectronis albescens** (Rydb.) Lunell.

Delphinium albescens Rydb. Bull. Torr. Cl. 583 (1899).

Walupaton (W. B. Bell) Fargo (Cl. Waldron).

478. **Plectrornis bicolor montanense** (Rydb.) Lunell.

Delphinium bicolor montanense Rydb. Fl. Mont. p. 157 (1900). Medora (Cl. Waldron).

Delphinium (Discorides) Linn. Sp. Pl. 536 (1753). *Sensu stricto* with type, D. *peregrinum* Linn. l. c. is found in European Mediterranean region. *Consolida* Brunfels, Herb. Viv. Ic. 84c (1532) has no species known in this State except perhaps *C. Ajacis* (Linn). Nwd. and only under cultivation.

CHRISTOPHORIANA Gesner. Hort. Ger. p. 253. (1561).

Actaea Linn. Syst. (1737), but not *Actaea* Plinius XXVII: 7, 26, which is *Sambucus Ebulus* Linn.

479. **Christophoriana arguta** (Nutt.) Lunell.

Actaea arguta Nutt.; T & G. Fl. I: 35. (1838).

Devil's Lake, Pleasant Lake, Dunsieth, St. John.

480. **Christophoriana arguta alabastrina** Lunell.

Actaea arguta alabastrina Lunell, in Am. Midl. Nat. Vol. II. p. 123. (1911).

Among the species in all the localities just mentioned.

Family 46. **PODOPHYLLEAE** D. C. Syst. II. p. 31. 32. (1821).

CAULOPHYLLUM L. C. Richard in Michx. Fl. Bor. Am. I: 204 .(1803).

481. **Caulophyllum thalictroides** (Linn.) L. C. Rich. .l c.

Leontice thalictroides Linn. Sp. Pl. 312. (1753).

Cass County: Fargo.

Family 47. **BERBERIDEAE** Vent., Tab. III. p. 83. (1799).

BERBERIS Cuba, Hort. Sanit. (15th Cent.), also Jacob de Manliis in Brunfels, Herb. Viv. Ic. p. 174. (1531).

482. **Berberis vulgaris** Bellonius, Cult. (1553), also Clusius; Linn. Sp. Pl. 330. (1753).

Originally cultivated. Leeds.

Family 48. **MENISPERMACEAE** DC., Prod. I. p. 85. (1824).

MENISPERMUM Tour., Acad. Reg. 237. (1705), also Dill., Gen. p. 150. (1719). Linn. Syst. (1735). Gen. (1757 and 1754).

483. **Menispermum canadense** Linn. Sp. Pl. 34. (1753).

Seemingly always sterile. Pleasant Lake, Towner.

Order 23. RHOEDALES.

Bartling, Ord. Nat. Pl. p. 254. (1831).

Family 49. **PAPAVERACEAE** B. Jussieu, Hort. Trian., A. Jussieu, Gen. (1789).

Papaver Virgilius Georg. I. 212, IV. 131, 545. Aen. I: 78.

484. **Papaver cereale** Virgilius l. c., Columella X, 314.

Papaver rhoeas Lobelius, Gerard, Dodonaeus (1557).

An escape from gardens, Leeds.

485. **Papaver soporiferum** Virgilius, Aen. IV: 131.

PAPAVER SOMNIFERUM Linn. Sp. Pl. 508. (1753).

Subspontaneous. Leeds.

BELHARNOSIA Sarracen ex Adanson Fam. p. 43. (1763).

Sanguinaria Dillenius (1732), Linn., *not* Plinius nor Tragus = *Panicum sanguinale* Linn.

486. **Belharnosia mesochora** (Greene) Lunell.

Sanguinaria mesochora Greene, in Pittonia Vol. V, p. 308 (1905).

St. John (perhaps distinct); Fargo (Bergman).

Family 50. **FUMARIACEAE** D. C. Syst. II, p. 105. (1821).

Subfamily *Fumarieae.*

CAPNORCHIS Boerhave, Index. Alter. Planter I: 309. (1727).

Bicuculla Adanson, Fam. Pl. II: App. 23. (1763).

487. **Capnorchis formosa** (D. C.) Lunell.

Bicuculla formosa (DC.) Howell.

Subspontaneous. Leeds.

Subfamily *Corydalieae.*

CORYDALIS Castor Durante (1585) Vent. Choix. 19. (1803), also Medicus, Phil. Bot. 96. (1789).

Capnoides Tour. Els. p. 335. (1695), I. R. H. p. 423. (1700), Adanson, Fam. Pl. p. 431. (1763).

488. **Corydalis aurea** Willd. Enum. Pl. 740. (1809).

Capnoides aureum (Willd.) Kuntze. Rev. Gen. Pl. I: 14. (1891).

Peninsula of Lake Ibsen, Turtle Mountains.

Family 51. **SILIQUOSAE** Linn. Phil. Bot. 34. (1751). Also Ray, Meth. Pl. 119. (1681).

Cruciferae B. Jussieu, Hort. Trianon (1759).

TOMOSTIMA Raf., Neogenyton 2. (1825).

Drabella Bubani, Fl. Pyr. III. 197. (1901) in part.

Draba Linn. in part, *not* Dioscorides = *Lepidium Draba* Linn.

489. **Tomostima micranthum** (Nutt.) Lunell.

Draba micrantha Nutt.; T. & G. Fl. N. A. I: 109. (1838).

Draba caroliniana micrantha (Nutt.) A. Gray, Man. Ed. 5. 72. (1867).

Minot; Medora (Cl. Waldron).

490. **Tomostima luteum** (Gilb.) Lunell.

Draba lutea Gilib., acc. to DC. Syst. II: 35.

Draba nemorosa Linn., var. *leiocarpa* Lindbl.

Leeds, Peninsula of Lake Ibsen.

491. **Tomostima nemorosum** (Linn.) Lunell.

Draba nemorosa Linn. Sp. Pl. 643. (1753).

Towner.

THLASPI Dioscorides 2, 147 (Ruellius' ed.) 189. (1547). Linn. Syst. (1735). Gen. 193 (1737), 242 (1754). Ray I: 838. Gesner. Hort. 284. (1561).

492. **Thlaspi fatuum** Gesner, Hort, Germ. (1561): also Ray l.c.

Thlaspi Bursa pastoris Linn. Sp. Pl. 647. (1753).

Bursa pastoris Weber, Wigg. Prim. Fl. Holsat. 47. (1780).

Capsella pastoralis Dulac. Fl. Pyr. 189. (1867).

Capsella Bursa-pastoris Medic. Pflanzengatt. I: 85. (1792).

Leeds, and everywhere else.

TERUNCIUS Lunell, nomen novum (lat. **teruncius**, a small coin, the shape of the fruit suggesting the likeness. Cfr. also the English name Penny Cress).

Thlaspi Dill.,not Diosc. *Thlaspidium* Tragus, Hist. Stirp. 85. (1552), Spach (1838), Adanson (1762) = *Biscutella*, *Thlaspidea* Opiz (1852), all unacceptable names, as built on *Thlaspi*. *Pachyphragma* (= *Thlaspi latifolium* Linn.), used by DC. in Prodr. I. 175 as a section, from which Reichenbach in Nom. 179. (1841) probably got it. *Nomisma* DC., antedated by *Nomisma* Wright & Arn (= *Rhynchosia*).

493. **Teruncius arvensis** (Linn.) Lunell,

Thlaspi arvense Linn. Sp. Pl. 646. (1753).

Leeds, and everywhere.

RORIPA Scopoli, Fl. Carn. 520. (1760).

Radicula Dillenius, Cat. Pl. Giss. 80. (1718), in part. Hill, Br. Herbal. 265 (1756), *not* Dodonaeus Pempt. 666 (1583) = *Raphanus*.—*Nasturtium* R. Br. in Ait. Hort. Kew. Ed. 2, 4: 109. (1812), in part.

494. **Roripa palustris** (Linn.) Besser, Enum. 27. (1821).

Sisymbrium amphibium var. *palustre* Linn. Sp. Pl. 657. (1753).

Nasturtium terrestre R. Br. in Ait. Hotr. Kew. Ed. 2. 4: 112. (1812).

Nasturtium palustre DC. Syst. 2: 191. (1821).

Radicula terrestris (R. Br.) Woot. & Standley, Contr. U. S. Nat. Herb. Vol. 19. 284. (1915).

Leeds; Kulm (Brenckle).

495. **Roripa hispida** (Desv.) Britton in Mem. Torr. Bot. Club 5: 169. (1894).

Brachylobus hispidus Desv. Journ. de Bot. 3: 183. (1814).

Nasturtium hispidum DC. Reg. Veg. Syst. 2: 201. (1821).

Radicula hispida (Desv.) Britt. Torreya VI: 32. (1908).

Leeds, Peninsula of Lake Ibsen, Oberon.

496. **Roripa hispida** var. **glabrata** Lunell in Bull. Leeds Herb. no. 2, p. 6. (1908).

Roripa terrestris var. *globosa* Aven Nelson in Bot. Gaz. 52: p. 264. (1911).

Leeds.

497. **Roripa sinuata** (Nutt.) Hitchc. Spr. Fl. Manhattan 18. (1894).

Nasturtium sinuatum Nutt.; T. & G. Fl. N. Am. I: 73. (1838).

Radicula sinuata (Nutt.) Greene, Leaflets I: 113.(1905).

Dickinson (Bergman).

Armoracia Plinius XIX: 5. Columella, Heucher, Rivinus, Ruppius, Gaertner. *Cochlearia* Tour. Els. 183. (1684).

498. **Armoracia Rivini** Ruppius Fl. Jen. 67. (1726).

Roripa Armoracia (Linn.) A. S. Hitchc. l. c. (1894).

Thoroughly established. Leeds.

LESQUERELLA S. Wats. Proc. Am. Acad. 23: 249. (1888).

499. **Lesquerella argentea** (Pursh) Mac M. Met. Minn. 263. (1892).

Myagrum argenteum Pursh Fl. Am. Sept. 434. (1814).

Vesicaria argentea DC. Syst. 2: 297. (1821).

Lesquerella Ludoviciana S. Wats. l. c. 252. (1888).

Dickinson (Bergman).

500. **Lesquerella alpina** (Nutt.) Wats. l. c. 251. (1888).

Lesquerella spathulata Rydb., Contr. U. S. Nat. Herb. 486. (1896).

Beach (Bergman).

501. **Lesquerella Lunellii** A. Nels. Bot. Gaz. 42: 49. (1906).

Leeds, Butte.

502. **Lesquerella Lunellii lutea** A. Nels. Bot. Gaz. 54: 149. (1912).

Pleasant lake, Dunsieth, Towner, Minot, Williston.

PHYSARIA A. Gray, Gen. Ill. x: 162. (1848).

503. **Physaria didymocarpa** (Hook.) A. Gray, l. c.

Vesicaria didymocarpa Hooker, Fl. Bor. Am. I: 49. pl. 16. (1830).

Medora (Bergman).

BIAURICULA Bubani, Fl. Pyr. III. 207. (1901).

Iberis Dillenius Gen. 6. (1719). Linn. Syst. (1735). also Gen. Pl. 192. (1737), 292. (1754. not Diosc.

The *Iberis* Dioscorides is an entirely different plant. Adanson (Fam. Pl. 2, p. 422. (1763) called the Linnaean Genus *Iberis* by the name *Arabis* Dod. Dodonaeus did not even give this name exclusively to plants of this genus. *Iberis* Democritus is *Lepidium Iberis* Linn. Sp. Pl. 645. (1753). In any case the *Iberis* (Dill.) Linn is inapplicable.

(*To be continued.*)

THE STORY OF OUR BIRDS THROUGHOUT THE YEAR 1915.[1]

BY BROTHER ALPHONSUS, C. S. C.

It affords me great pleasure to have the honor to address the members of the Chicago Ornithological Society. The regularity with which this society holds it meetings, and the methodical way in which its members study bird life are evident tokens of the vitality of the association. It seems to me that such manifest enthusiasm for so delightful a pursuit as ornithology should awaken a similar interest in many others. Indeed it seems to me that the influence of those who are so fortunate as to be admitted to this society should create a wide-spread desire to share the advantages they possess. Why should the Chicago Ornithological Society not feel that it has a great mission to the people of this city—to be instrumental in promoting a knowledge of

[1] A paper read before the Chicago Ornithological Society on Tuesday Evening, January 4, 1916.

bird life among old and young. Their prestige as ornithologists should easily fit the members of this society for such a mission.

In what way may this mission be best fulfilled? Undoubtedly I think the most effective way of achieving this praiseworthy object is to try to arouse not only interest, but even enthusiasm, for the study of ornithology among the teachers of our schools. Without doubt we can succeed in awakening both interest and enthusiasm for this branch of study in a body of men and women to whom the ideals of life make an especially strong appeal. And among the ideals that should enlist the devotion of every refined person is the visible expression of the beautiful in the life of our native birds. To make the acquaintance of the feathered denizen of our fields and forests is to be made like them—happy the livelong day.

Here then is the great mission for the Chicago Ornithological Society. Why should its members not take the initiative in every thing that can promote the study of birds among the teachers of our schools? By lectures the members can show the importance of this branch both from an economic and an aesthetic standpoint. By leading expeditions out into the country these naturalists can create a genuine enthusiasm for the study of the living bird in its native haunts. And after all, the chief object of all our efforts lies in this one point—to arouse enthusiasm. If we succeed in this, all else must be successful.

It may not be amiss to give you my own experience in doing what I could to create both interest and enthusiasm in the study of our birds. Besides what I may have done toward this object by the publication of my articles on bird life in THE AMERICAN MIDLAND NATURALIST, I had last autumn the opportunity of guiding the teachers of the South Bend Training School in their study of ornithology. Every Thursday afternoon I met the young ladies of this institution at 4 p. m., and led them through fields and groves on the banks of St. Joseph River. These trips continued until the weather grew unfavorable for further observations. Next April we propose to resume our study, and hope to do much better work, for spring is always more suitable than autumn for finding a great abundance of bird life.

So far what I have said to you is mostly by way of suggestion. Men of experience know the value of wise suggestion and always welcome it. If I may offer advice at any time to the members

of the Chicago Ornithological Society it will be gladly given. We who are devoted to the study of ornithology should feel that we are in truth members of a fraternity, and should be desirous of helping one another as best we may. Encouragement is probably the most helpful thing we can give; so let us give it gladly.

I shall now do my best to relate to you the story of our birds as their lives were revealed to me throughout the year, 1915. And what a fascinating story it was. Daily did I watch the movements and the habits of the many species of birds that passed or stayed near my Indiana home. Through bleak winter and balmy spring, through sweet summer and serene autumn, the birds are always with us. To become acquainted with them is to love them. They are truly friends, for which we may feel affection.

In winter the Snowbirds fly before us darting at one another; the Blue Jay displays his beautiful coat as he passes from tree to tree; flocks of Crows are started in fields or woods, and their distant cawing is characteristic at this season; Tree Sparrows, Nuthatches, Chickadees and Brown Creepers may be seen not unfrequently on winter days. In March the first notes of the Song Sparrow and the Bluebird are the joy of the bird-lover; the first Robin is noted by every man and child; the loud whistle of the Meadowlark rings in our fields; Blackbirds appear, and are not unwelcome; April and May follow, when bird life reaches its climax, and then begins to recede. The month of June finds most of the birds rearing their first brood; in July families of birds are found feeding; in August nearly all the singing ceases, and the autumn migration begins. By September the migration is in full swing, and many species not seen since spring reappear; October is much like September, but seldom gives the diligent observer more than 50 species; November marks the close of the autumn migration, hardly ever affording as many as 25 species. With the advent of December, our feathered friends are so few that most people think there are none to be found.

Our story starts in December, 1914, in which the following species were found: Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Screech Owl, Brown Creeper, Tree Sparrow, Snowbird, Pine Grosbeak, Chickadee, and Vesper Sparrow. The total number of species seen was 14.

The species that were most abundant in December were the Crow, found on 22 days; the Blue Jay, with 29 records; the White-breasted Nuthatch, seen on 21 days; the Red-headed Woodpecker, recorded on 25 days. Species that were less abundant were the Downy Woodpecker, with 12 records; the Brown Creeper, with 10; the Snowbird, with 7. The least abundant species were the Tree Sparrow, recorded 4 times; the Song Sparrow, 7 times; thd Vesper Sparrow, once—on the 25th—the only winter record I have ever made of this species; the Goldfinch, 5 times; the Screech Owl, the Pine Grosbeak, the Chickadee, the Hairy Woodpecker, each recorded once.

The Pine Grosbeak was found on Dec. 4th in a mulberry tree just in the rear of Corby Hall at Notre Dame. A number of English Sparrows were curiously watching the bird. Other records of this species were made on October 22, and November 6, 1914. On the October date a pair of these Grosbeaks was seen. The male was reddish on the head and back; the female, mottled with brownish and lighter; the call-note is distinctive.

The Vesper Sparrow, recorded on Dec. 25, was flying in a row of maple trees, and out on the snow, where some weeds stood higher than the snow. Here the bird ate some of the seeds of the weeds. The peculiar flight of this species make its identity certain to the trained observer.

The Song Sparrows, found in December, were always near one of the lakes at Notre Dame. Sometimes the bird's call-note was heard from a small island in a frozen lake; but most frequently the Song Sparrow was heard or seen near an open runway leading to an ice-house. Usually the observer hears this sparrow's call-note before seeing the bird; when silent its identification may be known by the bird's peculiar flight.

In January, 1915, the species seen were: Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker. Goldfinch, Downy Woodpecker, Song Sparrow, Screech Owl, Brown Creeper, Tree Sparrow, Snowbird, Chickadee, Hairy Woodpecker, Cardinal. The total number of species seen was 14.

In this month the Blue Jay had 29 records; the Crow had 22; the White-breasted Nuthatch had 20; the Brown Creeper had 18; the Snowbird had 17; the Red-headed Woodpecker and the Tree Sparrow had 14. Species having fewer records were: Downy Woodpecker, seen on 9 days; the Chickadee and Cardinal,

found on 3 days; the Song Sparrow and Goldfinch, observed twice; the Screech Owl and Hairy Woodpecker, each with a single record.

In the winter months the habits of the Brown Creeper may be studied to advantage. Among these the creeping of the bird is most interesting. Usually it will fly to the base of a tree, and begin to ascend on one side—sometimes going almost to the top without deviating but a few inches in its course. Then it may fly down again to the base of the same tree and ascend on the opposite side. At other times the bird is quite irregular in its method of ascending. A very faint call-note will attract the attention of the observer, who depends on this to be made aware of the bird's presence. I once saw a Brown Creeper go up the two-story side of a brick house to the roof, the bird losing its hold twice.

The species seen in February, 1915 were: Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Brown Creeper, Tree Sparrow, Snowbird, Chickadee, Cardinal, Bluebird, Robin, Killdeer, Herring Gull. The total number of species seen was 16, and total for the three winter months was 20, the largest record I have yet made.

As in January, the Blue Jay has most records in February—24; the Crow came next, with 23. The Brown Creeper had 12 records; the Snowbird had 9; the White-breasted Nuthatch and the Red-headed Woodpecker each had 6; the Son Sparrow had 7; the Tree Sparrow had 11; the Robin had 8. Species with very few records were: Bluebird, with 3; Cardinal, and Herring Gull, with 2; Killdeer, Chickadee, and Goldfinch, with one.

February of this year, after the 12th, proved an unusually interesting month to the bird-lover. Robins and Bluebirds appeared on the 13th, which was a warm, bright day, and the notes of both species were heard. On the 20th the songs of the Bluebird and Song Sparrow were heard. On this day I also heard, for the first time in all my observations, the song of the Brown Creeper, which was low and rapid and pleasing. By the 21st of the month Song Sparrows were singing continuously—something I do not remember hearing so early ever before.

The winter of 1914–15 showed an increase in the distribution of the Crow, Blue Jay, Brown Creeper, and Song Sparrow; a decrease, for the White-breasted Nuthatch, Red-headed Wood-

pecker, Downy Woodpecker, Snowbird, Tree Sparrow, and Chickadee. Three species seen last winter, but not this, were: Bronzed Grackle, Meadowlark, and Snowflake.

The March records for 1915 totalled 19, which was 11 fewer than those of 1914. The eleven species not found March, 1915 were: White-breasted Nuthatch, Goldfinch, Screech Owl, Chickadee, Hairy Woodpecker, Cardinal, Snowflake, Sparrow Hawk, Purple Finch, Sapsucker, Phoebe.

The latest record in February for the White-breasted Nuthatch was the 27th; no record occurred in April; the bird reappeared on the 1st of May, and disappeared until June 20th. Barring the one May record, we have the unprecedentedly long absence of 111 days. The spring migration of this species has always been exceedingly interesting to me, but I am at a loss to know what can be the determining cause of its withdrawal as spring approaches.

Another species that is irregularly seen in winter and early spring is the Goldfinch. This year the only record in February was on the 23d. After this date the species failed to appear until April 13th—an absence of 48 days. Who can explain this irregularity?

The species recorded in March, 1915 were: Crow, Blue Jay, Red-headed Woodpecker, Downy Woodpecker, Song Sparrow, Brown Creeper, Tree Sparrow, Snowbird, Meadowlark, Bluebird, Robin, Killdeer, Herring Gull, Canada Goose, Red-winged Blackbird, Bronzed Grackle, Flicker, Kingfisher, Cowbird.

The most abundant species in March were: Crow, Blue Jay, Snowbird, Meadowlark, Bluebird, Robin, Red-winged Blackbird, and Bronzed Grackle. Less abundant species were: Downy Woodpecker, with 5 records; Herring Gull, with 6; Tree Sparrow, with 9; Red-headed Woodpecker and Killdeer with 13. The least abundant species were: Brown Creeper, Canada Goose, Flicker, Kingfisher, and Cowbird, each with one record.

Dates of migration in March were: Meadowlark on the 3d; Canada Goose, on the 9th; Red-winged Blackbird and Bronzed Grackle, on the 12th; Flicker, on the 19th; Kingfisher, on the 30th; Cowbird, on the 31st. Against these seven migrants there were 18, in March, 1914.

The following disjointed observations, made in March, 1915 may be of interest: March 3.—Mating song of Blue Jay was

heard—low and sweet.—March 5.—A snowstorm; only the Blue Jay was seen.—March 6.—Tree Sparrows numerous in a garden.—First jingling note of the Snowbird.—March 7.—First note of the Robin in this month.—March 14.—First loud calling-note of the Red-headed Woodpecker.—March 15.—Crows carrying food.—March 19.—First Red-headed Woodpecker out of woods; in winter this species is confined to woods.—First note of the Flicker.—March 20.—Herring Gull fishing in a small lake.—March 23.—Bluebirds, Robins, Meadowlarks, Red-winged Blackbirds, in full song.

The species seen in April were: Crow, Blue Jay, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Brown Creeper, Tree Sparrow, Snowbird, Chickadee, Meadowlark, Bluebird, Robin, Killdeer, Red-winged Blackbird, Bronzed Grackle, Flicker, Kingfisher, Cowbird, Field Sparrow, Fox Sparrow, Towhee, Phoebe, Sparrow Hawk, Mourning Dove, Vesper Sparrow, Sapsucker, Kingbird, Golden-crowned Kinglet, Hermit Thrush, Brown Thrasher, Chipping Sparrow, Ruby-crowned Kinglet, Chimney Swift, Myrtle Warbler, White-throated Sparrow, Spotted Sandpiper, House Wren, Baltimore Oriole, Warbling Vireo, Pine Warbler, Yellow Warbler, Catbird, Yellow Palm Warbler, Purple Martin. Bobolink. The total number of species seen was 47.

Species that had few records in April were: Brown Creeper, with 9; Spotted Sandpiper and House Wren, with 8; Downy, Woodpecker, Baltimore Oriole, Warbling Vireo, with 7; Sapsucker, with 6; Ruby-crowned Kinglet, Chimney Swift, with 5; Tree Sparrow, Hermit Thrush, White-throated Sparrow, with 4; Fox Sparrow, Pine Warbler, Catbird, Yellow Palm Warbler, Sparrow Hawk, with 2; Chickadee, Yellow Warbler, Kingbird, Purple Martin, Bobolink, with one.

The dates of migration in April were: Field Sparrow, on the 4th; Fox Sparrow, Towhee, Phoebe, Sparrow Hawk, Mourning Dove, on the 5th; Vesper Sparrow, on the 6th; Sapsucker, on the 7th; Golden-crowned Kinglet and Hermit Thrush, on the 9th; Brown Thrasher and Chipping Sparrow, on the 13th; Ruby-crowned Kinglet, Chimney Swift, Myrtle Warbler, on the 19th; White-throated Sparrow, on the 20th; Spotted Sandpiper, on the 21st; House Wren, on the 23d; Baltimore Oriole, Pine Warbler, on the 24th; Yellow Warbler, on the 26th; Catbird, Yellow Palm Warbler, Kingbird, on the 28th; Purple Martin, on the 29th;

Bobolink, on the 30th. The total number of migrants in April, 1915 was 26. For this month, in 1914, there were 28 migrants.

Some of the more notable of my observations in April, 1915 were the following: April 7, loud note of the Phoebe.—April 13, Goldfinches in summer plumage.—Field Sparrows in full song.—April 16, Mourning Doves building.—April 17, a Brown Thrasher singing for ten minutes in the afternoon.—April 19, Vesper Sparrow in full song.—April 23, one Snowbird on the ground in a cemetery; the last April record for this species was on the 26th.—April 30, Bobolink singing in a tree top at very brief intervals. I heard the song some distance away as I approached the bird. This was my earliest date for hearing the song of the Bobolink.

The species recorded in May, 1915 were: Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Screech Owl, Snowbird, Meadowlark, Bluebird, Robin, Killdeer, Red-winged Blackbird, Bronzed Grackle, Flicker, Kingfisher, Cowbird, Field Sparrow, Towhee, Phoebe, Mourning Dove, Vesper Sparrow, Hermit Thrush, Blue-headed Vireo, Brown Thrasher, Chipping Sparrow, Ruby-crowned Kinglet, Chimney Swift, Myrtle Warbler, White-throated Sparrow, Spotted Sandpiper, House Wren, Baltimore Oriole, Warbling Vireo, Pine Warbler, Yellow Warbler, Catbird, Yellow Palm Warbler, Kingbird, Bobolink, Screech Owl, Water Thrush, Barn Swallow, Black-throated Green Warbler, Orchard Oriole, Crested Flycatcher, White-crowned Sparrow, Yellow-throated Vireo, Indigo Bird, Gnatcatcher, Blackburnian Warbler, Wood Pewee, Red-eyed Vireo, Dickcissel, Greater Yellowlegs, Yellow-billed Cuckoo, Alder Flycatcher, Cedarbird, Bay-breasted Warbler, Black-throated Blue Warbler, Cape May Warbler, Chestnut-sided Warbler, Magnolia Warbler, Prairie Warbler, Rose-breasted Grosbeak, Redstart, Owenbird, Black and White Warbler, Maryland Yellowthroat, Tennessee Warbler, Least Flycatcher, Scarlet Tanager, Lesser Yellowlegs, Bank Swallow, Mourning Warbler, Black-poll Warbler, Nighthawk, Canadian Warbler, Wilson Warbler. Whip-poor-will, Hummingbird. The total number of species seen was 83.

The rare species in May were: Bay-breasted Warbler, Ovenbird, with 9 records; Yellow Palm and Chestnut-sided Warblers, with 8; Yellow-billed Cuckoo, White-crowned Sparrow, with 7; Barn Swallow, Scarlet Tanager, with 6; Bluebird, Yellow-throated

Vireo, Black-throated Blue Warbler, Rose-breasted Grosbeak, Maryland Yellowthroat, Tennessee Warbler, Least Flycatcher. Black-pool Warbler, Nighthawk, with 5; Towhee, Magnolia Warbler, Black and White Warbler, with 4; Blue-headed Vireo, Alder Flycatcher, Hummingbird, 3; Snowbird, Pine Warbler, with 2; White-breasted Nuthatch, Downy Woodpecker, Screech Owl, Ruby-crowned Kinglet, Water Thrush, Gnatcatcher, Greater and Lesser Yellowlegs, Cedarbird, Cape May Prairie, Mourning, Canadian, Wilson, Warblers, Whip-poor-will, with one record.

The May migrants were: Downy Woodpecker, departed on the 29th; Hermit Thrush, departed on the 31st; Ruby-crowned Kinglet, departed on the 10th; Myrtle Warbler, departed on the 20th; White-throated Sparrow, departed on 23d; Yellow Palm Warbler, departed on the 22d; Black-throated Green Warbler arrived on the 5th and departed on the 24th; White-crowned Sparrow, arrived on the 9th and departed on the 21st; Indigo Bird and Gnatcatcher, arrived on the 10th; Blackburnian Warbler, Wood Pewee, Red-eyed Vireo, arrived on the 11th; Dickcissel and Greater Yellowlegs arrived on the 12th; Yellow-billed Cuckoo, arrived on the 13th; Alder Flycatcher and Cedarbird, arrived on the 14th; Bay-breasted, Black-throated Blue, Cape May, Chestnut-sided, Magnolia, Prairie Warblers, Rose-breasted Grosbeak, Redstart, Ovenbird, arrived on the 15th; Black and White Warbler, Maryland Yellowthroat, Tennessee Warbler, arrived on the 16th; Least Flycatcher, Scarlet Tanager, Lesser Yellowlegs, arrived on the 17th; Mourning and Black-poll Warblers, Nighthawk, arrived on the 19th; Canadian Warbler, arrived on the 21st; Wilson Warbler, on the 22nd; Whip-poor-will, on the 23; Hummingbird, on the 25th.

Conclusion next number.

CRITICAL NOTES OF NEW AND OLD GENERA OF PLANTS.—VII.

BY J. A. NIEUWLAND.

NUMMULARIA.

The mycologists in a number of instances seem to have bee unfortunate in selecting a considerable number of hitherto uncorrected names which are invalidated by previous use. In the

time of Linnaeus it was considered wrong to have animals and plants with identical names. The later botanical codes have asserted independence from zoological nomenclature by accepting names already used for animals. None, however, dare go so far in encouraging confusion as to admit the same names in the different plant groups. Such breaches of a logical fundamental tenet have unwittingly been quite numerous The pardoning circumstance if any has been that mycological nomenclature has not been as carefully classified as that of the higher plants. In enquiring about *Nummularia* one would be perhaps nonplussed to ask whether the fungus or the primulaceous plant was meant. Mycologists have no right to take even temporarily rejected names of higher plants and apply them to such of their phyla. This practice arises perhaps from poverty of knowledge of classical languages or inability to make good names entirely new. If, however, a botanist considers a group of plants dignified enough to receive a generic caption he should, we take it, think the matter serious enough to endow it not only with a valid name, but with at least not a stupid one. Making a new genus by giving it a diminutive ending *ella,ula* or *iola* particularly when the first plant was named after some botanist is a ridiculous practice showing either ignorance or lack of seriousness on the part of the nomenclator, either or both of which make the systematic botanists justly appear ridiculous to other men of science, nor will such a practice be tolerated by a more careful and discriminating future.

The name *Nummularia* was used by the older botanists of the eighteenth century or earlier, and since 1753 for a plant segregated from the genus *Lysimachia* by S. F. Gray also, i. e., *Lysimachia Nummularia* Linn. To avoid confusion its use applied subsequently for a fungus is invalid. For the latter is suggested the name *Kommamyce*.

Kommamyce, Nom. Nov.

Nummularia Tul. 8 (1861–1865) not *Nummularia* S. F. Gray, Nat. Arr. Br. Pl. II. 300 (1821) Tulasne, L. R. & C., Sel. Fung. II. (1861–1865).

Among other species we have:

Kommamyce Bulliardi (Tul).

Nummularia Bulliardi Tul.

Kommamyce lateritia (Ell. & Ev.).

Nummularia lateritia Ell. & Ev.

Among the more important names of fungi that have been antedated by use for other plants the following may be mentioned. The name *Asteridium* Sacc. is peculiarly unfortunate. Not only was there an earlier *Asteridium* Englem[1] but also an *Asteridea* Lindley, (1839). The name is but a Greek diminutive of *Aster*, and the oldest of them is at most, but a poor makeshift. There are beside an *Asterias*, several *Asteriscus'*, an *Asteropsis*, *Asterioides*, and in the same family, an *Asteronia*, *Asterella*, and *Asterina*(!) all of these based on the same word with nothing but a suffix appended to give slight difference in form.

Moreover all of these are but Greek forms of *Stellaria*. To replace the untenable fungus name *Asteridium* may be suggested that of *Arberia* in honor of Agnes Arber who wrote a valuable and learned work of erudition on Herbals, their Origin and Evolution.

Arberia Nom. Nov.
Asteridium Sacc. I: 49 not *Asteridium* Englem. l. c. (1843).
Arberia juniperina (Cke).
Asteridium juniperinum (Cke).
Arberia lepidigenoides (Ell. & Ev.).
Asteridium lepidigenoides (Ell & Ev.).

BELONIA.

Still another example quite if not more inexcusable is the fact that the mycologists have permitted the name *Belonia*, whereas even Linnaeus[2] himself had a genus *Bellonia*! Moreover should one be tempted to quibble about the spelling of the word i. e., with one l instead of two, Adanson[3] had the Linnaean name *Bellonia* spelled with one l. Besides this the name *Belonium* with a different gender ending, is used as a name of another fungus making the chance for confusion, even if possible, still worse. When we remember that there is a *Belonidium* (Greek diminutive form) and a *Belloniella* (Latin, diminutive form) as also a *Belonopsis*, we are tempted to wonder whether the condition could be made even more ridiculous, by dedicating *all* the genera in the group to one botanist, and put numerals after them to distinguish them as they did the kings and emperors of old and no.

To replace the fungus name *Belonia* we suggest *Pradalia*

[1] Walpers, Rep. II. 958 (1843).
[2] Linnaeus C., Sp. Pl. ,172 (1753).
[3] Adanson, M., Fam. II. 158 (1763).

after E. Pradal[1] author of a work on Cryptogams of France. The *Belonium* Sacc. has no more reason for existence than the other, but there certainly can not be two such names in one branch of plants unless the subject of mycological nomenclature is to be made or remain a ridiculous matter, deliberately tolerated by men of science.

CATHARINEA.

Saccardo's *Catharinea*[2] is untenable because of the moss plant name so called by Ehrhart.[3] The name *Hyalospora* is apparently suitable and significant particularly in the case of the American species.

Hyalospora Nom. Nov.

Catharinea Sacc., and of the mycologists not *Catharinea* Ehrh. (1787) l. c. (which is a moss).

Hyalospora americana Comb. Nov.

Catharinea hyalospora Ell. & Ev.

DARLUCA Cast.

There was a *Darluca* Raf. (1820)[4] that rendered the fungus name preoccupied. It seems therefore necessary to replace the latter by another in **Kabathia**. Herman Kabath[5] after whom we name it, was the author of a work on the flora of Gleiwitz.

Kabathia Nom. Nov.

Darluca Cast. (1842) not *Darluca* Raf. (1820) = *Faramea* of the *Rubiaceae*.

Kabathia interseminata (Wint.) Nov. Com.

Darluca interseminata Wint.

Kabathia Filum (Biv.) Nov. Comb.

Darluca Filum (Biv.) Cast.

GAUTIERA Vittadini (1831)

The name of *Gautiera* Vittadini,[6] also written *Gautieria* is but another form of the Linnaean *Gaultheria*. It is, however,

[1] Pradal E., Cat. Plantes Crypt. Loire Infer.

[2] Spelled by some *Catharinia* the name is no better because the spoken word is the one that obviously must concern us in question of homonyms as it is this that is the source of confusion rather than a written one.

[3] Ehrhart F., Beitrage, 1, p. 190 (1787).

[4] Rafinesque, C. S. Am. Jr. Sc. Phys. VI, 87 (1820).

[5] Kabath H., Flora der Umgegend von Gleiwitz (1846).

[6] Vittadini C. Monographia Tuberacearum Med. (1831).

antedated by Rafinesque's[1] *Gautiera*, a substitute for the name proposed by Linnaeus. On the principle that even if the former name is inapplicable, the application of the latter is not thereby justifiable, we herewith propose *Uslaria* for the fungus in honor of J. J. Uslar[2] one of the earliest authors of a work on plant chemistry and physiology.

Uslaria Nom. Nov.

Gautiera Vitt., (1831) l. c., not *Gautiera* Raf. (1828).

Uslaria morchellaeformis (Vitt.) Nom. Nov.

Gauteria morchellaeformis Vitt.

GUEPINIA AND LAMIA

At least two cryptogams have masqueraded under this name *Guepinia*. One of these that of Hepp.[3] could in no sense have the right, so it was changed to *Heppia* Naeg. The *Guepinia* Fries, moreover is untenable being preceded by that of Bastard.[4] The *Guepinia* Fries. seems to have had a substitute suggested in *Guepiniopsis* Pat., but though a rather unsatisfactory makeshift, it were at least more in accordance with logical proceedure than to have two plants with the same name.

The genus of *Entomophthorineae*[5] called by Nowakowski *Lamia* was preceded by the use of the name *Lamia* Endlicher.[6] Moreover there is also a *Lahmia* that might be confused. The name is at that only a feminine form of the centuries old name adopted by Linnaeus, *Lamium*. **Culicicola** is suggested to replace the homonym.

Culicicola Nom. Nov.

Lamia Nowak., l. c., not *Lamia* Endlicher, (1841) nor *Lamium* Linn.

Culicicola Culicis (A. Braun). Nov. Comb.

Lamia Culicis (A. Braun) Nowak. l. c.

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[1] Med. Fl. I., 204 (1828).

[2] Uslar, Johann, Julius, Fragmente neuer Pflanzenkunde, Braunschweig (1794).

[3] Hepp. Ph. *Guepinia* eine nuee Flechtengatting, Vehr. Schw. Naturf. Gesell. XLVJJJ, 86, (2864).

[4] Bastard. T., Supp. a l'essai Fl. Dept. Maine et Loire. 35 (1812).

[5] Entomophthoreae (Pam. Akademii umiej. ed. Krakowie 1883). Die copulation einiger Entomophthorien (Bot. Zeit. 1877).

[6] Gen. 949 (1841).

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